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Prevention

RELATION CHOLESTEROL SYNTHESIS AND ABSORPTION TO CORONARY PLAQUE VULNERABILITY

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Background: The aim of this study is to evaluate the impact of surrogate marker levels of cholesterol synthesis and absorption on plaque vulnerability.

Methods: This study designed to enroll 80 stable angina pectoris patients. Target vessels with more than 50% diameter stenosis were imaged with a 20 MHz phased-array intravascular ultrasound (VH-IVUS) catheter and optical coherence tomography (OCT) wire. Definite-fibroatheroma (D-FA) was defined as 1) percent necrotic core area more than 20% in contact with the lumen in VH-IVUS; 2) percent plaque plus media cross-sectional area more than 40% in VH-IVUS; 3) fibrous cap thickness at the thinnest part less than 65μm in OCT.

Results: At least one D-FA was observed in 42 (53%) patients with 42 vessels. Campesterol-to-cholesterol ratio (Campesterol) was significantly higher in D-FA group, on the contrary, lathosterol-to-cholesterol ratio (Lathosterol) was significantly lower than non D-FA group. Percent necrotic core volume (%NCV) was significantly negative correlated with Lathosterol, but positive with Campesterol. On the other hand, thinnest fibrous cap thickness were significantly negative correlated with Campesterol, however, positive with Lathosterol. The independent predictors for the incidence of D-FA were hsCRP, Campesterol, Lathosterol, and %NCV (Table).

Conclusion: Higher inflammatory status, enhanced absorption, and reducedsynthesis of cholesterol may be related to plaque vulnerability.

Variable	Total	Definite TCFA (+)	Defite TCFA (−)	p
LDL cholesterol, mg/dl	119±28	127±27	112±27	0.03
Cholesterol sythesis (Lathosterol, μg/100mg total cholesterol)	86.1±49.4	68.5±29.3	96.1±44.2	0.007
Cholesterol absorption (Campesterol, μg/100mg total cholesterol)	188.0±91.9	218.5±92.4	159.2±83.3	0.01
hsCRP, ng/ml	741±608	968±758	515±269	0.004

Variable	r	95% CI	p value
Cholesterol sythesis (Lathosterol, μg/100mg total cholesterol)			
Percent necrotic core volume	−0.501	−15.8 to −5.69	<0.0001
Thinnest fibrous cap thickness	0.501	1.047 to 2.877	<0.0001
Cholesterol absorption (Campesterol, μg/100mg total cholesterol)			
Percent necrotic core volume	0.350	0.9 to 5.61	0.008
Thinnest fibrous cap thickness	−0.366	−1.227 to −0.236	0.005

Variable	Odds Ratio (95% Confidence Interval)	p value
hs CRP, per 10 ng/ml	1.003 (1.001−1.006)	0.01
Lathosterol, per 10μg/100mg total cholesterol	0.949 (0.916−0.983)	<0.0001
Campesterol, per 10 μg/100mg total cholesterol	1.038 (1.013−1.067)	<0.0001
Percent necrotic core, %	1.084 (1.012−1.161)	0.02